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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/727,452	12/04/2000	Sophie Balaven	612.39353X00	6580
20457	7590	07/14/2004	EXAMINER	
ANTONELLI, TERRY, STOUT & KRAUS, LLP 1300 NORTH SEVENTEENTH STREET SUITE 1800 ARLINGTON, VA 22209-9889			HOLMES, MICHAEL B	
			ART UNIT	PAPER NUMBER
			2121	

DATE MAILED: 07/14/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/727,452	BALAVEN ET AL.	
	Examiner	Art Unit	
	Michael B. Holmes	2121	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE (3) MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 December 2000.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-6 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 2,3 and 7-11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date: _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date: _____ | 6) <input type="checkbox"/> Other: _____ |



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Examiner's Detailed Office Action

1. This office action is responsive to application **09/727,452**, filed **Dec. 04, 2000**.
2. **Claims 1-14** have been examined.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 & 5 are rejected under 35 U.S.C. 102(e) as being anticipated by

Budge (USPN 6,678,642).

Regarding claim 1: *Budge* describes a method of generating a hybrid grid suited to a heterogeneous medium crossed by at least one geometric discontinuity of known geometry (*Abstract*), in order to form a model representative of fluid flows in this medium in accordance with a defined

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numerical pattern (*Abstract*), the structure of the medium being known a priori from available data acquired through in-situ measurements (C 4, L 25-33), analyses and/or interpretation of images of the medium (FIG. 5A & FIG. 5B; C 17, L 56-66), comprising forming a hybrid grid including at least one first structured grid for gridding of at least part of the medium (FIG. 2A; C 3, L 50-65), forming at least one second structured grid for gridding of another part of the medium (FIG. 2A; C 3, L 50-65), forming at least one cavity between the at least one first structured grid and each at least one second structured grid with a sufficient size to allow formation of at least one non-structured grid providing transition between the structured grids (FIG. 2A; C 3, L 50-65), characterized in that it includes forming each non-structured transition grid by means of power diagrams and by imposing conformity of the non-structured transition grids with the walls of each cavity. (FIG. 2A, FIG. 2B, FIG. 2C, & FIG. 2D)

Regarding claim 5: *Budge describes* a method for simulating (C 1 L 10-16), in accordance with a defined numerical pattern (C 15, L 40-52), the evolution of a process such as fluid flows in a heterogeneous medium crossed by at least one geometric discontinuity of known geometry (FIG. 3), the structure of the medium being known a priori from available data acquired through in-situ measurements (C 4, L 25-33), analyses and/or interpretations of images of the medium (FIG. 5A & FIG. 5B; C 17, L 56-66), comprising forming a hybrid grid including at least one first structured grid for gridding of at least part of the medium (FIG. 2A; C 3, L 50-65), forming at least one second structured grid for gridding of another part of the medium (FIG. 2A; C 3, L 50-65), forming at least one cavity between the at least one first structured grid and each at least one second structured grid with a sufficient size to allow formation of at least one non-structured grid

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providing transition between the structured grids (FIG. 2A; C 3, L 50-65), characterized in that it includes: forming the non-structured transition grids by using power diagrams and imposing conformity of the non structured transition grids with the walls of each cavity and solving the numerical pattern in the hybrid grid formed for the medium in order to model the process. (FIG. 2A, FIG. 2B, FIG. 2C, & FIG. 2D)

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being obvious over

Budge (USPN 6,678,642) in view of *Migdai et al.* (USPN 5,886,702).

The *Budge* reference has been discussed above and does not disclose the limitations embodied in claim 4. However, *Midgal et al.* teaches the limitations embodied in claim 4.

Regarding claim 4: characterized in that it includes imposing to polygonal edges forming the walls of each cavity to be the edges of a Delaunay type triangulation. (C 3, L 19-41) It would have been obvious at the time the invention was made to a person having ordinary skill in the art to combine *Budge* with *Migdai et al.* because Delaunay theories for the creation of irregular mesh lattices derive from the teachings of M. G. Voronoi and the studies he made of "Voronoi polygons" i.e., Voronoi determined that, for a set of data points in space, a proximity region could be

defined for each data point by a convex polygon created from the perpendicular bisectors of lines drawn from the point in question to its nearest neighbors. Moreover, when a triangulation follows Delaunay principles, a circumcircle defined by the vertices of a triangle will not contain another data point of the mesh. A Delaunay mesh procedure guarantees that for each triangle of the mesh the area within a circumcircle created from the three vertices will not contain any other data point of the mesh. (C 3, L 61-64)

7. Claims 6, 12-14 are rejected under 35 U.S.C. 103(a) as being obvious over *Budge* (USPN 6,678,642) in view of *Applicant's own admission* paragraph [0006].

Regarding claim 6: *Budge* does not disclose characterized in that each first structured grid is a non-regular grid, of CPG type. Applicant admits that this is old and well known. *see* [0006] It would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify *Budge* as taught by applicant's own admission.

Claim Objection

8. Claims 2, 3, & 7-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

9. The prior art made of record and (listed of form **PTO-892**) not relied upon is considered pertinent to applicant's disclosure as follows. Applicant or applicant's representative is respectfully reminded that in process of patent prosecution i.e., amending of claims in response to a rejection of claims set forth by the Examiner per Title 35 U.S.C. The patentable novelty must be clearly shown in view of the state of the art disclosed by the references cited and any objections made. Moreover, applicant or applicant's representative must clearly show how the amendments avoid or overcome such references and objections. *See 37 CFR § 1.111(c).*

Correspondence Information

9. Any inquiries concerning this communication or earlier communications from the examiner should be directed to **Michael B. Holmes** who may be reached via telephone at **(703) 308-6280**. The examiner can normally be reached Monday through Friday between 8:00 a.m. and 5:00 p.m. eastern standard time.

If you need to send the Examiner, a facsimile transmission regarding After Final issues, please send it to **(703) 746-7238**. If you need to send an Official facsimile transmission, please send it to **(703) 746-7239**. If you would like to send a Non-Official (draft) facsimile transmission the fax is **(703) 746-7240**. If attempts to reach the examiner by telephone are unsuccessful, the **Examiner's Supervisor, Anthony Knight**, may be reached at **(703) 308-3179**.

Any response to this office action should be mailed too:

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Director of Patents and Trademarks Washington, D.C. 20231. Hand-delivered responses should be delivered to the Receptionist, located on the fourth floor of **Crystal Park II, 2121 Crystal Drive Arlington, Virginia.**

Michael B. Holmes
Patent Examiner
Artificial Intelligence
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